

Acknowledgments

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Cover: Hopper Barge Wreck (21-HE-441, by Ed Nelson), Capsized Hopper Barge Wreck (21-HE-441, by Kelly Nehowig), Alumacraft Center Console Model R Wreck (21-HE-448, by Mark Slick), Owens Deluxe Cruiser Wreck (by Kelly Nehowig), Wooden Trunk Cabin Cruiser Wreck (21-HE-446, by Mark Slick).







MHM's Christopher Olson and volunteers Josh Knutson and Kelly Nehowig prepare for a dive (by Mark Slick).



MHM's Chair and Commodore Mike Kramer operates the research boat (by Mark Slick).



A Mark Slick selfie with Chris, Josh, and Kelly (hidden behind Mark).



Chris, Josh, Mark, and Kelly prepare for a dive (by MHM).



Volunteers Ed Nelson and Josh, and MHM's Chris prepare for a dive (by MHM).



Josh, Chris, and Kelly surfacing from a dive (by Mark Slick).



Ed during a dive (by Ed Nelson).



Mark recording the Wooden Trunk Cabin Cruiser Wreck (by Kelly Nehowig).



Chris measuring sediment on one of the Hopper Barge Wrecks (by Ed Nelson).



Kelly often uses an underwater navigation system he devleoped called NavDive to assist MHM with our research (by Kelly Nehowig, www.NavDive.com).



Josh inspecting the Wooden Trunk Cabin Cruiser Wreck (by Mark Slick).



Mark (by Mark Slick).



Kelly (by Mark Slick).



MHM's Ann Merriman and Christopher Olson (by Mark Slick).



Ed (by Kelly Nehowig).



Christopher (by Mark Slick).



Josh (by Ed Nelson).

Introduction

Shipwrecks and the artifacts associated with them tell a story. Removing or otherwise disturbing artifacts, treating them as commodities that can be sold, obliterates that story. Nautical archaeological and maritime sites are finite and are significant submerged cultural resources. Nautical, maritime, underwater, maritime terrestrial - MHM deals with all of these types of sites throughout the State of Minnesota. Maritime Heritage Minnesota's (MHM) mission is to document, conserve, preserve, and when necessary, excavate these finite cultural resources where the welfare of the artifact is paramount. MHM is concerned with protecting our underwater and maritime sites - our shared Maritime History - for their own benefit in order for all Minnesotans to gain the knowledge that can be obtained through their study. MHM's study of wrecks does not include the removal of artifacts or damaging the sites in any way. MHM does not raise wrecks or 'hunt' for 'treasure'. Submerged archaeological sites in Minnesota are subject to the same State statues as terrestrial sites: the Minnesota Field Archaeology Act (1963), Minnesota Historic Sites Act (1965), the Minnesota Historic District Act (1971), and the Minnesota Private Cemeteries Act (1976) if human remains are associated with a submerged site. Further, the case of State v. Bollenbach (1954) and the Federal Abandoned Shipwrecks Act of 1987 provide additional jurisdictional considerations when determining State oversight and "ownership" of resources defined by law as archaeological sites (Marken, Ollendorf, Nunnally, and Anfinson 1997, 3-4). Therefore, just like terrestrial archaeologists working for the State or with contract firms, underwater archaeologists are required to have the necessary education, appropriate credentials, and hold valid licenses from the Office of the State Archaeologist (OSA).

MHM completed two side and down-imaging sonar surveys of Lake Minnetonka in September-November 2011 and May-June 2012 – the Lake Minnetonka Survey 1 Project (LMS-1) and the Lake Minnetonka Survey 2 Project (LMS-2). Prior to MHM's two comprehensive surveys, there was one recognized nautical archaeological site on the lake bottom and another five wrecks were known. In 2013, MHM completed the Lake Minnetonka Nautical Archaeology 1 Project (LMNA-1) and Lake Minnetonka Nautical Archaeology 2 Project (LMNA-2). After the completion of these projects, there were 17 wrecks on the bottom of Lake Minnetonka that were recognized as nautical archaeological sites and had site numbers assigned by the OSA. Further, another 10 wrecks that currently do not qualify as archaeological sites were located and rudimentarily documented. Additionally, two maritime archaeological sites gained OSA site numbers, and two cars and one pontoon swim raft were located. In summary, before the beginning of the Lake Minnetonka Nautical Archaeology 3 Project (LMNA-3), there were 27 known wrecks and 5 other known sites/cultural resources recognized on the bottom of Lake Minnetonka.¹

¹See MHM's *Lake Minnetonka Nautical Archaeology 1 Project Report* and *Lake Minnetonka Nautical Archaeology 2 Project Report* for a detailed descriptions of the wrecks, sites, and anomalies already documented.

Preface

During the Lake Minnetonka Nautical Archaeology 3 Project (LMNA-3), MHM investigated 36 anomalies and returned to 8 known wrecks to gather additional information about them. The fieldwork was conducted from late April to early August 2014. Initially, the proposed number of wrecks and anomalies to be investigated was 4 wrecks and 19 anomalies. However, MHM was able to take advantage of decreased boat traffic throughout June, and July due to the "No Wake" restrictions placed on the entirety of Lake Minnetonka by the Lake Minnetonka Conservation District (LMCD) because of high water and flood conditions. Therefore, MHM's project budget for fuel was able to accommodate more research days, the length of work days increased, the lack of lake traffic allowed greater and more efficient access to sites and anomalies, and volunteers Kelly and Ann Nehowig were able to investigate particular targets quickly and easily using their boat as well. Further, the rationale to return to 8 previously identified wrecks instead of the originally anticipated 4 sites was to include them in MHM's 2014 sediment study. Bruce Koenen of the OSA suggested the study in order to determine the rate of sediment build-up in different areas of Lake Minnetonka. This data could then be used to approximate the sinking dates of boats and other resources, using wrecks with known sinking dates for comparison. The data gathered has proven useful and the study will continue into the future.

Results of the Lake Minnetonka Nautical Archaeology 3 Project

Research Design

The purpose of the LMNA-3 Project was to determine the nature of specific anomalies, re-visit particular known wrecks sites to answer questions about certain attributes of those resources, and to begin the sediment build-up study. MHM determined which anomalies would be investigated from an analysis of sonar data that suggested they were submerged cultural resources. The 36 anomalies examined were 12, 15², 30.1, 35, 36, 37, 38, 41.1, 64, 65 105, 115, 116, 119, 128, 129, 131, 133, 172, 226, 230, 264, 368, 374, 431, 432, 434, 437, 438, 445, 453, 454, 458, 460, 461, and 462 along with 8 known wrecks identified by MHM during earlier projects. Using data accumulated from the fieldwork as a starting point, MHM conducted research to place newly recognized nautical archaeological sites and anomalies in their historical contexts. Minnesota Archaeological Site Forms were filed with the OSA when appropriate and ultimately, all data collected during the LMNA-3 Project will be utilized to nominate Lake Minnetonka as a Historic Shipwreck District.

Methodology

The methodology used to identify and rudimentarily document underwater archaeological anomalies is straightforward but logistically complicated. MHM used the GPS coordinates of a wreck or anomaly, data produced during the LMS-1 and 2 projects, to drop a weighted diver down buoy near the target. Then the dive boat

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²Anomaly 15 did not require on-site investigation using SCUBA to determine its nature (see below).

anchored a short distance away from the buoy and divers geared up for the dive. At any given time, there were between two and four divers underwater. If the buoy anchor weight landed near and sometimes on the anomaly or wreck, no search for the target was conducted. However, for a variety of reasons, a brief search for the target was conducted until it was located or it was determined that the anomaly was a false sonar return. If a cultural resource was located, the divers photographed and recorded video of the site, recorded its basic measurements, examined any obvious attributes, and measured sediment build-up if appropriate. The order that MHM investigated the prioritized list of anomalies was flexible to accommodate the availability of volunteer divers, the depth of the anomaly or wreck, and the work was designed to take advantage of the 'No Wake' status of the entirety of Lake Minnetonka due to extreme high water levels and flood conditions.

Sediment Build-Up Study

Sections of Lake Minnetonka with a hard bottom comprised of compacted sand and gravel have little – if any – sediment build-up on the lakebed or inside of wrecks found in those areas. Contrastingly, other parts of Lake Minnetonka are very soft, sometimes with several feet of silt lying on top of the lakebed. Initially MHM planned to put 'sediment collectors' on known sites and newly identified sites that would be re-visited in the future and the silt inside them would be measured. However, this idea was proven to be impractical since the collectors could not always be secured properly, on some wrecks they could be disturbed by sport divers, they were too small, and the amount of sediment collected in them could not be guaranteed to be accurate. Therefore, MHM decided to include only those wrecks in the study that were upright and had open hulls that would contain sediment that settled out as water moved through an area. Through research, MHM has determined the sinking dates of many wrecks and as these sites become part of the sediment study, they can be used for comparison to other wrecks found in the same area.

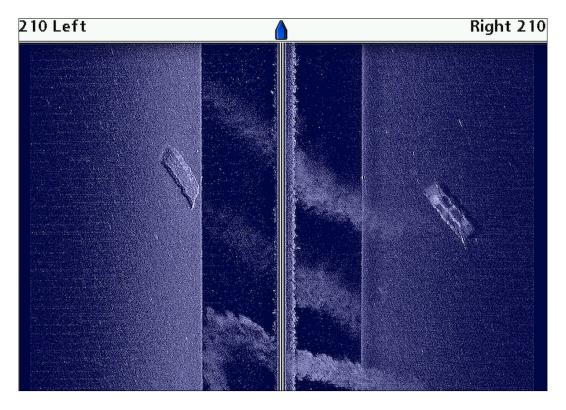
Results

After the completion of the LMNA-3 Project fieldwork in August 2014, there are now 36 identified wrecks on the bottom of Lake Minnetonka or that were once on the bottom, including a Woodlands Culture dugout canoe removed from the lake in 1934. Of these wrecks, 23 of them have 22 Minnesota archaeological site numbers; 2 wrecks are features of one site. The precise sinking dates or at least the year of disposition of 10 of the 13 remaining wrecks are known, and MHM will fill out site forms for them when appropriate. Further, 3 other types of maritime sites now have archaeological site numbers, there are 4 maritime sites without numbers, 3 cars without numbers, and 2 'other' objects. During the LMNA-3 Project specifically – of the 36 anomalies investigated – MHM and the volunteers confirmed the existence of 7 new wrecks, 4 new submerged maritime sites, 1 car, 2 'other' human-made objects, 6 anomalies were large rocks, 15 anomalies were false sonar returns primarily comprised of vegetation, and the nature of one anomaly was determined without in-person investigation. Further, MHM gathered new information on the Wayzata Bay Wreck, Gideon Bay Wreck, Damaged

Bow Utility Wreck (formerly the Damaged Bow Wreck), Alumacraft Model R Runabout Wreck, Owens Cruiser Deluxe Wreck, Blue Star Miamian Custom Runabout Wreck (formerly the Outboard Speedboat Wreck), Red Fiberglass Boat Wreck (formerly the Span Boat Wreck), and the Terra-Marina Amphibious Houseboat Wreck that were investigated during the LMNA-1 and LMNA-2 Projects. The data gathered during these new investigations on known wrecks advanced our understanding of those sites, their maritime history, and 6 of them were included in the sediment study.

Hopper Barge Wrecks, 21-HE-441 (Anomalies 453 and 454)

MHM recorded a poor quality sonar image of Anomaly 453 in November 2011 during the LMS-1 Project. The anomaly was recorded during a sharp turn and it was distorted; often images produced during turns cannot be trusted to accurately represent an object. Further, Anomaly 453 is located at the convergence of three different transects, one of which was recorded at an angle instead of north-south or east-west, as an adjustment to an irregular transect group recorded two months earlier in an effort to avoid a sailboat regatta. This odd survey pattern produced a triangular-shaped data gap at the three transect conversion point and unfortunately, Anomaly 454 lay in that triangle. In order to obtain an accurate image of Anomaly 453, MHM re-scanned the area in mid-May 2014 and easily located the target – and fortunately – Anomaly 454 as well. The improved sonar image of Anomaly 453 clearly indicated that the object was a barge wreck and it was apparent that Anomaly 454 was a similar wreck that was capsized. The center of Anomaly 453 is 210 feet from the center of Anomaly 454.



A side-scan sonar image of Anomaly 454 (left) and Anomaly 453 (right) recorded by MHM.

In June 2014 MHM archaeologists and volunteers confirmed that both anomalies are wooden hopper barges, one upright and one capsized. Hopper barges were used in Excelsior Bay and other parts of Lake Minnetonka where the dredging of the lake bottom created or deepened channels, removed underwater obstructions or deepened the lake in a given area. The dredge boats shoveled lake bottom silt and stones into the hopper barges for disposal in another area of the lake or the shoreline. Captain John R. Johnson owned the Minnetonka Dredging Company (MDC) in Excelsior on Solbergs Point, active throughout the first half of the 20th Century. Fred W. Pearce, principal owner of the Excelsior Amusement Park that opened in late May 1925, hired the MDC to dredge out the southeast corner of Excelsior Bay next to the park's roller coaster in September – after a first successful season. Pearce contended his property required more parking space and the lake soil taken from this portion of the bay was transferred to the shoreline to build-up an area that could support cars. This work was halted in early October by an injunction supported by local fishermen and others who contended that the dredging operation destroyed fish spawning grounds and taking lake soil was using public property to benefit a private company. By mid-October, a district court judge ruled in Pearce's favor, determining that the dredged-out area would encourage fish spawning and deepening the water in the bay was an improvement that would benefit everyone. Soon "Capt. J. R. Johnson of Excelsior has two big dredges with full crews at work. The work will be pushed to completion unless the early coming of winter prevents. The Fred W. Pearce company, owners of the Excelsior Amusement park, will use the made land for parking space and picnic ground" (Minnetonka Record 1925a-c).

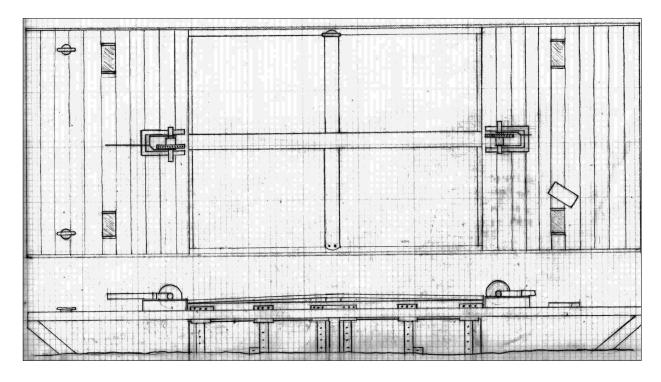
It is apparent that Captain Johnson anticipated more dredging contracts from the Amusement Park in the near future. In late December 1925 he had "a crew of men at work at Solbergs Point building barges. There will be three of these; two will be 16x40 feet and a third barge will be 16x50". MHM asserts the Hopper Barge Wrecks are the two 40 foot barges mentioned above and this contention is supported by evidence of Captain Johnson's dredging operations in Excelsior Bay during 1926-1927. In Spring 1926, a new family area was "laid out on land that is being made by dredging operations". Further, by the end of the year, "the new fill has been completed and this new ground will afford the patrons of the park a great deal more space for walks" and the new 'Fun House' was to be constructed on this dredge fill. By late May 1927, a 1,200 seat picnic pavilion built on "made land beside the bay" was ready for patrons (*Minnetonka Record* 1925d, 1926a-b, 1927).





Anomalies 453 and 454 are seen here in 1926, anchored in front of the Excelsior Amusement Park on Excelsior Bay (courtesy of the Excelsior-Lake Minnetonka Historical Society, digitized by MHM).

Anomalies 453 and 454 are sisters of the same design and size: 44.6 feet long, 16.5 feet in the beam, with a 4.75 foot depth of hold. The decks and bottoms of both wrecks are planked athwartships and the ends of the vessels are raked with watertight compartments. Anomaly 453 has two open deck hatches on both ends with one hatch cover sitting on the deck next to its opening. Three large metal cleats survive on Anomaly 453, two on one end and one amidships; MHM suspects three other cleats are missing. An amidships deck coaming borders four open deck compartments that are separated by bulkheads topped with metal beams. Planks have been attached to the centerline bulkhead to create a ramp that would allow dredge spoil to easily slide into the hull and spread out to fill the compartment. Each of the four compartments has an outer hull flap that is hinged at the top, below the gunwale and coaming. Two windlasses are attached to the deck next to the compartments, with chains wound around them, that were used to open and close the side flaps. The common form of hinged flaps used in hopper barge construction beginning in the late 1800s – to dispose of dredge spoil out of the hull – were located on the bottom of the vessel, not the side. To MHM's knowledge, this side flap design is unique to these hopper barges and represents an innovation developed by Captain Johnson.



Plan and profile drawings of Anomaly 453, the upright Hopper Barge Wreck. The drawings show the number of attributes still present on the wreck. They illustrate the detail in the two side hinged outer hull flaps and the angle of the raked ends (by Christopher Olson, MHM).



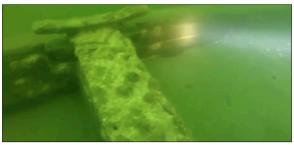
Anomaly 453 has 4 deck hatches, 2 on each end. Note the athwarthips deck planking and cleat (by Ed Nelson).



Anomaly 453 has raked ends. At this corner dry rot is evident, indicating the vessel had a long working life before she sank (by Ed Nelson).



The metal athwartships beams on Anomaly 453 have bulkheads underneath them. This beam likely had a large cleat attached to it during the barge's working life (by Ed Nelson).



The metal athwartships beam with the surviving cleat attached to the gunwale of Anomaly 453 (by Ed Nelson).



A windlass on the deck of Anomaly 453 (by Ed Nelson).



Anomaly 453's windlasses still have their chains attached (by Ed Nelson).



Anomaly 453 has deck coaming around the four watertight compartments (by Ed Nelson).



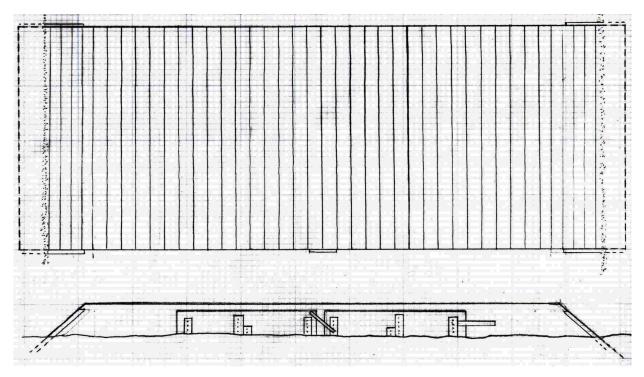
MHM's Christopher Olson (left) and volunteer Josh Knutson (right) prepare to measure Anomaly 453 (by Ed Nelson).



Either Anomaly 453 or 454 moored in Excelsior Bay near Solbergs Point and the Minneapolis and St. Louis Railway, north of the Excelsior Amusement Park (courtesy of the Excelsior-Lake Minnetonka Historical Society, digitized by MHM).



Anomalies 453 and 454 are moored together in Excelsior Bay near one of Captain Johnson's dredge boats. The hopper barges are moored just west of the Minneapolis and St. Louis Railroad bridge that separated Excelsior and St. Albans Bays (courtesy of the Excelsior-Lake Minnetonka Historical Society, digitized by MHM).



Plan and profile drawings of Anomaly 454, the capsized Hopper Barge Wreck. The drawings show the athwartships bottom hull planking, the two side hinged outer hull flaps, and the raked ends (by Christopher Olson, MHM).



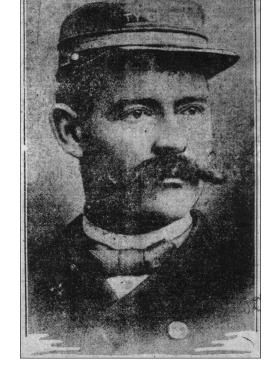
Anomaly 454's side and bottom (by Kelly Nehowig).



Anomaly 454's raked end (by Kelly Nehowig).



Above: Two of Anomaly 454's outer hull flaps. A piece of wood has been nailed to a stanchion that separates them, keeping them closed (by Kelly Nehowig).



Right: Captain John. R. Johnson in 1895, designer, builder, and owner of the Hopper Barge Wrecks (*Minneapolis Journal* 1921).

MHM contends the two 40 foot-long barges that comprise 21-HE-441 were constructed by Captain Johnson during the winter of 1925-1926. Once completed, the barges were nearly five feet longer than originally planned during their early phase of construction. MHM hypothesizes the two hopper barges, attached to each other for lake travel, sank together in the same incident. One of the barges might have been swamped by heavy waves in high winds and took the other to the bottom with her, breaking any towlines that connected the two vessels. Another theory holds that the hopper barges had outlived their usefulness for the dredging company and were intentionally scuttled at the same time to dispose of them, possibly when the dredging company began using steel barges (Danson 2011, 32-33). No contemporary account of either possible disposition

of the two wrecks has been located. Therefore, in order to determine a probable sinking date for the hopper barges, MHM considered the silt build-up inside and around the Streetcar Boat *White Bear*, sunk in 1926, for comparison. The hull of the *White Bear* Wreck has 3 feet of sediment build-up inside her hull and is located in the general vicinity of 21-HE-441. Anomaly 453 has 3.55 feet of sediment in her hull; however, it is unknown whether the vessel carried any mud or soil at the time of her sinking, although it seems likely. Therefore, MHM is considering the 2.50 feet of the outer hull that is exposed – not buried in the lake bottom – resulting in 2.25 feet of sediment built-up around the outside of the wreck. MHM estimates that the two hopper barges that comprise site 21-HE-441 sank between 1945 and 1955 based on the amount of sediment build-up around the hulls. Further, Anomaly 453 exhibits dry rot in various places along her hull, an indicator of age and decades of use prior to her disposition on the lake bottom. MHM submitted an archaeological site form to the OSA in mid-July 2014 and acquired the Hopper Barge Wrecks site number at that time.

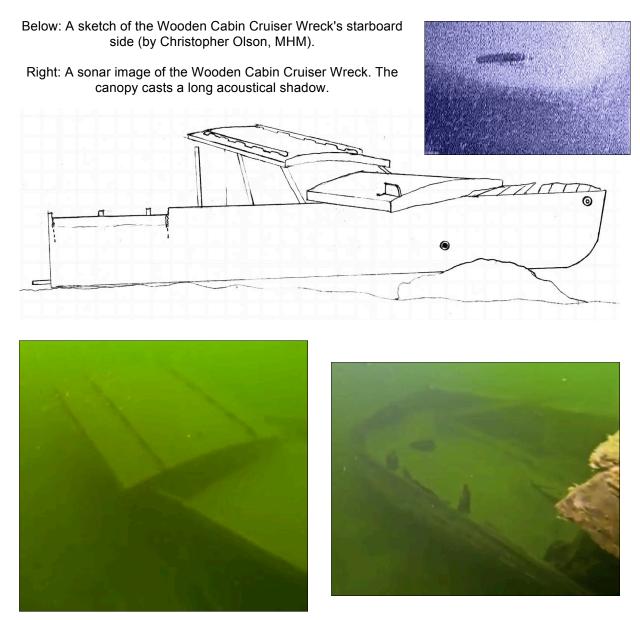
Wooden Trunk Cabin Cruiser Wreck, 21-HE-446 (Anomaly 38)

MHM recorded a sonar image of Anomaly 38 in September 2011. The sonar signature is comprised of an elongated shadow cast over an indistinct object. MHM archaeologists and volunteers investigated the anomaly in late June 2014 and determined it to be a wooden cabin cruiser wreck. Two dives were conducted to collect construction and site condition data in order to determine the approximate age and sinking date of the vessel. The Wooden Trunk Cabin Cruiser Wreck is 22.00 feet long and 6.50 feet wide with a flush foredeck, 1 starboard and 1 port below-gunwale portholes³ near the bow, and a square transom. The hull was painted white with surviving traces, and the bottom of the hull has a significant amount of grey anti-foiling paint still extant. A splash rail is attached to the outer hull just under the gunwale amidships and extends diagonally to the stern. The joint where the hull's sides meet the stern is covered with a metal strip. On the port side of the transom, one strake has extensive dry rot that occurred prior to sinking and is an indicator of age and wear. The wreck has a forward trunk cabin and an open amidships cabin section with a canopy extending aft, with hand rails on top. The trunk cabin and canopy are dislodged and have collapsed onto the starboard side. The trunk cabin might have had rectangular windows on three sides, but since the cabin roof has collapsed, this is difficult to ascertain. Just above the waterline forward of amidships on the starboard side, a through-hull hole exists that may have allowed the discharge of toilet water. This hole was plugged with a rectangular piece of wood prior to the boat's disposition on the lake bottom. At the transom stern on the starboard side a similar rectangular piece of wood wedged into the round exhaust hole. Further, it seems that the trunk cabin's glass had been removed from the vessel prior to her disposition on the lake bottom. On the port side bow, also above the waterline, a jagged hole is punched through the hull. This hole would allow water to enter the boat in calm waters if the vessel was moving. The

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³Initially MHM identified the port and starboard below gunwale holes as hawseholes, where anchor chains passed through from inside a hull. However, cabin cruisers rarely had hawseholes and MHM located only a few examples of that design, and only on larger vessels. If the Wooden Trunk Cabin Cruiser Wreck's portholes are actually hawseholes, then MHM suggests the vessel began her life as a workboat that was converted into a cabin cruiser.

wreck's engine, which would have been located inside the open cabin amidships, was removed prior to the vessel's sinking. Therefore, MHM contends the boat was stripped of her engine, windows, and some fittings, the toilet discharge hole and exhaust hole were plugged in order for the vessel to be towed successfully, unwanted wood and other items were placed in the hull, and a hole was punched into her port side bow sending her to the bottom of the lake. The wreck's damaged condition – her dislodged trunk cabin, open cabin, and canopy, and her damaged port side gunwale – probably occurred when she hit the lakebed hard. This section of Lake Minnetonka is comprised of hard-packed sand, gravel, and rocks, with no cushion that several inches or feet of sediment would provide.



The dislodge canopy and trunk cabin roof of the Wooden Cabin Cruiser Wreck (by Kelly Nehowig).

The open stern of the wreck (by Kelly Nehowig).



The stanchions of the dislodged canopy on the wreck (by Kelly Nehowig).



Volunteer Mark Slick documents the starboard side of the hull toward the bow (by Kelly Nehowig).



The foredeck of the Wooden Trunk Cabin Cruiser Wreck (by Mark Slick).



The wreck landed on some boulders during the wrecking process, allowing an investigation of the hard chine and the keel (by Mark Slick).



This hole in the port side bow may have caused the vessel to sink and may have been inflicted purposefully (by Mark Slick).



The port transom is reinforced with a metal strap and the wood suffered from dry rot priot to the wreck's sinking (by Mark Slick).

To determine the approximate construction date of the Wooden Trunk Cabin Cruiser Wreck, MHM has considered several hull and design attributes. Firstly, the outer hull strakes are held to the vessel's frames by slotted wood screws. This type of screw was used in boat construction throughout the early part of the 20th Century until 1939, when Phillips head screws were the dominant type in use (Rybczynski 2000, 83-84). Further, the wreck's hull design suggests a construction date from the 1910s-1920s. A design attribute that supports this contention is the flush nature of the foredeck; most cruisers dating from the 1930s and later were of the raised foredeck design, particularly found in vessels of this size. In addition, the hard chine and heavy keel construction of the wreck is similar to the Capsized Wooden Boat Wreck (21-HE-418) identified by MHM in 2013. MHM contends these wrecks are contemporary in construction and were built prior to 1930.

To establish a probable sinking date, MHM is certain the vessel sank prior to July 1, 1959 due to the lack of a registration number on her hull. However, the amount of sediment build-up in the hull aft of the canopy is an indicator of the amount of time the wreck has spent on the lake bottom. The area where the Wooden Trunk Cabin Cruiser Wreck lies consists of hard packed sand, gravel, and rocks with little loose silt on the lakebed. The bow landed on large rocks when she sank, inclining the wreck, causing any silt that landed in the hull to slide to the starboard stern quarter. The silt in this corner of the wreck measured 8 inches deep. MHM estimates that if the silt was distributed evenly in the open hull of the wreck, it would measure approximately 2 inches deep throughout. While this little amount of sediment does not seem substantial and may suggest a recent sinking date, areas of hard packed sand and gravel do not accumulate sediment quickly. For example, the Damaged Bow Utility Wreck (Anomaly 43) lies to the southwest of the Wooden Trunk Cabin Cruiser Wreck, also on hardpacked sand. According to MHM's research, this vessel likely sank prior to 1962 (see below) and holds only a trace of sediment in her hull. Therefore, MHM contends the approximately 2 inches of silt accumulated in the hull of Anomaly 38 supports a sinking date of 1945 or earlier. MHM submitted an archaeological site form to the OSA in mid-July 2014 and acquired the Wooden Trunk Cabin Cruiser Wreck's site number at that time.

Alumacraft Center Console Model R Wreck, 21-HE-448 (Anomaly 172)

During a second review of sonar footage recorded in September 2011, MHM recognized Anomaly 172 as a probable wreck. MHM archaeologists and volunteers dove on Anomaly 172 in late June and late July 2014 and recognized the wreck as an Alumacraft Model R Runabout. MHM's research efforts located a newspaper account of the sinking of an outboard motor boat that occurred in early June 1952. In this report, a 14 year-old boy named Tony McKeown was riding in a boat with Robert Odell when it capsized. MHM located an Anthony McKeown of the correct age and contacted him. Mr. McKeown responded to MHM's letter in early August and confirmed that he is the boy named in the story, and that Anomaly 172 is the boat wrecked that day. Mr. McKeown graciously agreed to inform MHM about the details of the boat's wrecking process. He and Mr. Odell worked at All Sports, Inc. in Excelsior and had traveled across Excelsior

Bay to Curly's⁴ on Tonka Bay for lunch. On their way back to work, winds had increased and the waves were rough. Mr. McKeown recalled that they were hit by guatering waves - swells that hit a boat on its bow or stern quarter - so large that he slid across the boat's front bench seat. This sudden shift in weight, combined with the high swells, caused the boat to capsize. Mr. McKeown remembers the boat sinking, but does not remember any other details until he regained consciousness at a dock in Excelsior. The newspaper story fills in some information. Mr. Odell and Tony clung onto the overturned Model R until she sank, with Mr. Odell supporting the boy in the water from that point. Apparently the hull resurfaced for a brief time, but then took a final plunge to the lake bottom. On shore, "Little Ruth Sampson" witnessed the accident and reported it to authorities in Excelsior. Clayton Holden, a member of the Excelsior Fire Department and owner of a 26-foot cruiser, arrived on the scene first and pulled Mr. Odell and Tony out of the water. Volunteer Fire Department members revived Tony on the Excelsion Municipal Dock after 30 minutes. Mr. Holden recalled the rescue during a newspaper interview the following year since he had not only saved Mr. Odell and Tony, he had pulled an 11 year-old boy out of Excelsior Bay earlier in the 1952 summer season. He remarked that he hoped there were no near-drownings in 1953 (Anthony McKeown, personal communication, August 4, 2014; Minnetonka Record 1952, 1953).



Tony McKeown, passenger on board the Alumacraft Center Console Model R Wreck, when she sank – then and now (courtesy of Anthony McKeown).

Two Saved From Over-turned Boat

The newspaper headline from the Alumacraft Center Console Model R Wreck accident (Minnetonka Record 1952).



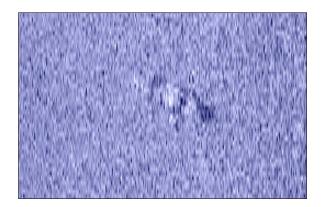
An Alumacraft Center Console Model R Runabout (Aluma Craft Boat Company 1956, 11).

During the wrecking process, the Alumacraft Center Console Model R Wreck righted herself before she landed on the lake bottom. The hull of Anomaly 172 is 11.58 feet long and 54 inches wide, but the site is 13 feet long due to the addition of an outboard

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⁴Curly's Tonka Bay Resort is now known as The Caribbean Marina.

motor. The wreck lies in a southwest to northeast orientation, with the bow pointing to the southwest. The wreck has an enclosed foredeck with a bow handle, two bench-style seats, a square transom, stern carrying handles, and hull-length splash rails. Compared to Anomaly 20.1, another Alumacraft Model R Runabout Wreck (see below) that was operated using its outboard's tiller, 21-HE-448 has the optional – and more expensive – center console with a steering wheel and a glass windshield. The steering wheel is a replaced custom example and is suggestive of an aircraft. Mr. McKeown told MHM that Mr. Odell (as well as his own father) were pilots and had flown over the wreck area to try and spot the Alumacraft Center Console Model R, but with no success (Anthony McKeown, personal communication, August 4, 2014). MHM contends Mr. Odell customized the boat with an airplane steering wheel after he purchased the vessel.



A side-scan sonar image of 21-HE-448..



A down-image of 21-HE-448.

The well-known Aluma Craft logo on the starboard stern quarter of the Alumacraft Center Console Model R Runabout Wreck (by Kelly Nehowig).



The Alumacraft Center Console Model R Runabout Wreck as seen from the bow. Note the intact windshield (by Mark Slick).





The wreck as seen from the stern. As she rests on the lake bottom, she tilts slightly to port (by Mark Slick).





The wreck has a customized steering wheel, the type that is normallly found on an aircraft (by Mark Slick).

Left: The red gas tank is wedged underneath the wreck's center console in the port side (by Kelly Nehowig).

Mr. McKeown believed that Anomaly 172 carried a 16 HP Johnson Motor, remembering that the boat was rated for a motor of that size (Anthony McKeown, personal communication, August 4, 2014). However, evidence suggests the wreck carries a 1950 Johnson Sea-horse 10 HP outboard motor, regardless of the maximum horsepower rating of 16 in 1952.⁵ It is apparent that Johnson did not construct a 16 HP motor in the early 1950s and the design of the motor attached to 21-HE-448 matches the 1950 10 HP motor. The outboard is still attached to a fuel line and gas can. The gas can was dislodged from its position under the center console during the wrecking process. MHM hypothesizes that the can, which has air and gasoline inside and would be buoyant, might have floated in the water column for a time after sinking, only resting inside the hull as the silt below filled the gap underneath it. The can is now wedged under the console amidships. The motor is in the down operating position and the wreck does not have a registration number, indicating she sank prior to July 1, 1959, when registration was first required, confirming Mr. McKeown's recollections of the accident. Model R Runabouts were constructed between 1949-1959 (Cheynne Nordby, personal communication, June 28, 2013) and knowing the manufacturer's hull number would indicate her year of manufacture. The significant amount of sediment deposited in the hull prohibited determining the number in 2014, but the boat was constructed between 1949 and early 1952 in Minneapolis.

⁵By 1957, the Alumacraft Model R was rated for an 18 HP outboard motor and was always marketed as being nearly as fast as a racing hull (Aluma Craft Boat Company 1957, 14).





Above: The powerhead of a 1950 10 HP Johnson Sea Horse outboard motor. The silver part of the cowling is unique to the 10 HP model.

Left: The wreck's motor (by Kelly Nehowig).

MHM has confirmed that 21-HE-448 sank in early June 1952, but documenting the silt build-up in the hull is useful as a comparison to near-by wrecks. Knowing the amount of sediment inside the hull of the Alumacraft Center Console Model R Wreck is particularly helpful for future projects since the sinking date is known and can be used in the future as a tool to assist MHM in determining site formation dates. The depth of hold from the gunwale to the vessel's bottom is 24 inches at the bow, 18 inches amidships, and 15 inches in the stern (Aluma Craft Boat Company 1957, 14). The sediment in the hull of Anomaly 172 is unevenly distributed, with more piled up on the port side than the starboard. On the port side forward the sediment is up to the gunwale, making the silt depth 24 inches. On the starboard side, there is 18 inches of silt built-up, where the average would be about 21 inches. Therefore, on average, .34 inches of sediment built-up inside the hull every year since June 1952.



An Alumacraft Center Console Model R Runabout (Aluma Craft Boat Company 1957, 14).

For comparison, the Correct Craft Agua Skier Deluxe Wreck (21-HE-424) that sank between July 1, 1959 and 1962 is approximately 540 feet to the southeast of 21-HE-448 and has accumulated .49 inches of sediment in her hull yearly. The sediment inside the hull of Anomaly 172 built-up at a slower rate than the Correct Craft Wreck, but this situation is expected if another wreck's condition is also taken into account. The Owens Cruiser Deluxe Wreck (Anomaly 55, see below) sank on July 31, 1970 and has an evenly distributed 8 inches of sediment in her hull, building up at a rate of .18 inches per year. Anomaly 55 is located 890 yards to the northwest of Anomaly 172. The area were Anomaly 55 rests is comprised of a harder bottom than the place where Anomaly 172 is lying, and similarly, is much harder in comparison to where the Correct Craft rests. It is apparent that water is moving more swiftly toward the lake's outlet at Gray's Bay to the northwest of Anomaly 172 than to the southeast of her. This site is a significant part of Lake Minnetonka's maritime history and the history of the famous homegrown Minnesota Alumacraft brand. MHM submitted an archaeological site form to the OSA in mid-July 2014 and acquired the Alumacraft Center Console Model R Wreck's site number at that time.

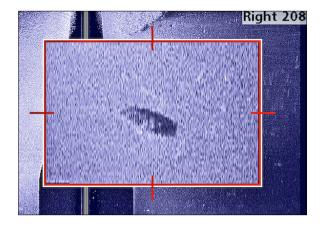
Update: Damaged Bow Utility Wreck, 21-HE-447 (Former Damaged Bow Wreck, Anomaly 43)

In October 2013 MHM identified Anomaly 43 as a wooden utility boat with extensive damage to her bow that occurred in a collision. The Damaged Bow Utility Wreck is 15.6 feet long with a 63-inch beam. Her port side bow is destroyed and separated from the gunwale, the starboard bow is damaged and the 'M' in 'MN of her registration number is attached to the hull and the shadow of the 'N' is evident. 6 MHM returned to the wreck in early June and late July 2014 to answer some questions and measure sediment buildup in the hull. During this new investigation, MHM determined that a section of the wreck's stempost survives and is attached to a piece of the starboard hull that was pushed into the bow space during the wrecking process. A smaller piece of the bow (with a fragment of the stempost still connected) where the majority of the registration number had been affixed to the hull, but is now mostly missing, was located lying on the lake bottom. The last letter of the registration, an 'L', is extant and the shadow of an 'A' is also apparent. Therefore, the partial number is MN _ _ _ _ AL and indicates the boat first registered with the State in 1959. The undamaged starboard side of the hull aft of the extant 'M' has no evidence that it had a State year validation sticker adhered to it. Physical evidence supplied by the DNR suggests that year validation stickers were first used in 1962. However, a newspaper article about boat registrations states that "boat owners need licenses, stickers by Saturday", suggesting that year validation sticker use began at least by the 1961 boating season (Minnetonka Record 1961a). Therefore, MHM contends Anomaly 43 was involved in a nighttime collision sometime between July 1, 1959 and the end of the boating season in 1961, after the initial written evidence found supporting the use of stickers and before the physical evidence of verified sticker use in 1962. While MHM has not found a contemporary account of this specific accident, boating statistics for Hennepin County (unfortunately the numbers reflect incidents on all the county's lakes, not just Lake Minnetonka, but it by far had the most

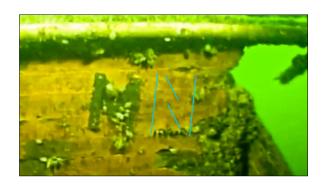
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⁶See MHM's Lake Minnetonka Nautical Archaeology 2 Project Report for a detailed description of the wreck.

boating events) show that there were 27 boat accidents reported in 1961 (*Minnetonka Record* 1961b).



A sonar image of 21-HE-447.



Above: The 'M' in MN is still affixed to the hull and the shadow of the 'N' is visible (by Mark Slick). Right: MHM's Olson located this bow fragment with the shadow of an 'A' and the 'L' still affixed. Olson placed the hull piece back on the bottom exactly where he found it (by Mark Slick).



The Damge Bow Utility Wreck's port side bow (by Ed Nelson).

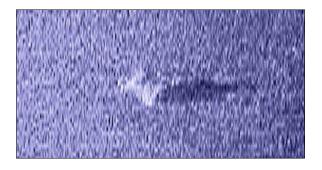


At the stern a lifting eye has a line connected to it that leads to her deployed grapnel anchor and the mast light is up. Another line, or the other end of the line that is attached to the anchor, extends out from the wreck and is rather long, suggesting it would be used to pull a water skier. The water skiing line being deployed and the mast light being up suggests that the boat, when it collided with another boat, might have been pulling a skier in the dark. The area where the boat sank is mostly hard sand and this fact is reflected in the lack of sediment in her hull. The hull holds just a trace of silt, less than .50 inch, a characteristic that is reflected in areas where hard packed sand is common. For comparison, the Wooden Trunk Cabin Wreck (21-HE-446) that lies 500 yards to the northeast of the Damaged Bow Utility Wreck, has 2 inches of sediment built up in her hull, and MHM contends she sank in 1945 or earlier. The sediment build-up comparison between these two wrecks is consistent considering a probable sinking date for the Damaged Bow Utility Wreck of 1959-1962. The wreck's brand and model remain unknown, although she was probably constructed in the 1940s. MHM submitted an

archaeological site form to the OSA in late July 2014 and acquired the Damaged Bow Utility Wreck's site number at that time.

Ford Model T Doodlebug, 21-HE-bm (Anomaly 119)

MHM recorded a sonar image of Anomaly 119 during the LMS-2 project in mid-May 2012. In late June 2014, MHM dove on the anomaly and determined it is a 1919-1925 Ford Model T car or truck converted into a tractor. This type of 'home-made' tractor is referred to as a Doodlebug, MHM cannot discern if the vehicle was originally a car or truck because those machines were nearly identical with the exception of the body. which does not exist in Anomaly 119. However, Anomaly 119 has a worm gear axle that would have been incorporated into a Model T truck, but the body of the tractor is shorter than either a car or truck. It measures 6.00 feet between the front and rear axles and during the conversion, the worm gear axle could have been added to a car frame. On either side of the tractor a support beam extends from the front of the vehicle to the rear axle. Anomaly 119 has two dual rear tires with chains on the inner set, indicating it required traction on ice, and the left rear outer tire is missing. MHM contends the Doodlebug had a belt attached to the rim of the left rear wheel that was connected to a circular saw that was used to cut wood. Three of the rubber tires have survived in places and the spokes of the wheel rims are wood. The rubber tire of the left front wheel is missing and the wheel is sitting at an angle, suggesting the tie rod broke, resulting in an inability to effectively steer the vehicle. MHM asserts the broken tie rod resulted in the tractor's abandonment on the ice. Diagnostic attributes of Anomaly 119 are the cursive Ford logo embossed on the grease caps for the wheel bearings. The long steering column is longer than would be expected for a car or truck, placing the driver's seat above the rear axle, indicating the vehicle is a tractor. The steering wheel is present but has been knocked off the steering column and has slid down it, landing near the battery and on top of the transmission. The tractor's seat is no longer extant.





Above: A sonar image of Anomaly 119.

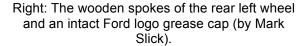
Above Right: The left side of the Fort Model T Doodlebug (by Mark Slick).

Right: The front of Anomaly 119 showing the misaligned left front wheel. The radiator is lying on the lake bottom in the foreground (by Mark Slick).





Above: The right rear tires are intact, with chains around the inner wheel (by Mark Slick).





The rear axle's worm gear (by Mark Slick).

The steering wheel has slid down the steering column and lies next to the battery. The steering wheel and battery are both on top of the transmission (by Mark Slick).



The left rear outer tire is missing, possibly to attach a belt used to power a wood saw (by Mark Slick).



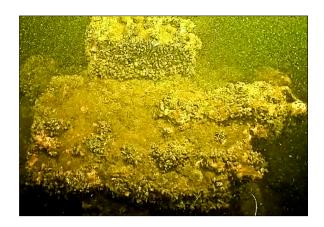




The wheels have Ford logo grease caps (left) that look like the one on the right.



The four-cylinder engine is intact, with four spark plugs and four ignition coils mounted next to the cylinder head on the left side. A parking brake lever is found on the ride side of the transmission at the rear end of the engine and the radiator, normally mounted in an upright position in front of the engine, has fallen forward and lies on the lake bottom. The carburetor, exhaust manifold, and starter motor are present on the right side of the engine, while a six-volt battery for the starter motor is behind the engine next to the transmission. Starter motors were introduced into the Model T in 1919. This attribute, combined with the presence of the wooden spoke wheels that were replaced by steel examples in 1926, indicates that the original Model T before its conversion into a Doodlebug was constructed between 1919 and 1925 (Cubel and Cubel 2013; Ford Motor Company 2014).





The Doodlebug's engine with the ignition coils on top (by Mark Slick).

A Ford Model T Doodlebug (Smokestak 2012).

The Shaw Manufacturing Company of Kansas (along with other companies) marketed a conversion kit that allowed a car owner to transform their 'old car' into a tractor beginning in the 1920s. It cannot be determined whether Anomaly 119 was transformed using a kit or if it was changed by the innovation of its owner. MHM cannot use sediment build-up to determine an approximate sinking date of Anomaly 119. However, considering that the area of the lake where Anomaly 119 is located was relatively undeveloped until 1950 and the presumed conversion of the Model T happened during the Great Depression, a pre-1950 sinking date is

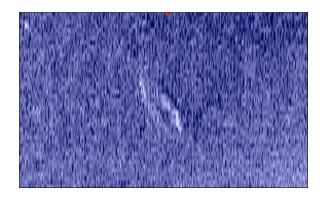


Shaw tractor conversion ad (*Modern Mechanix* 1932).

probable. This Ford Model T Doodlebug represents not only a part of Lake Minnetonka's maritime history but transportation, industrial, agricultural, economic, and lumbering histories as well. The tractor could have been used in the summer months in farm fields to pull heavy loads. In the winter, it could cut and haul timber and haul loads of cut block ice from the lake. MHM submitted an archaeological site form to the OSA in mid-August 2014 and acquired the Ford Model T Doodlebug's alpha site number at that time.

Small Aluminum Wreck (Anomaly 264)

MHM recorded a sonar image of Anomaly 264 in September 2011 and identified it as a small aluminum rowboat wreck in early June and late July 2014. The wreck is 11.50 feet long with a 3.20-foot beam at her widest point, the gunwale has a flat sheer, and it is covered with a caprail of extruded aluminum. At the transom, a wide and flat one-piece stern casting overhangs the back of the wreck, large enough to accept a small outboard motor. Her damaged pointed bow is suggestive of a canoe and her transom stern narrows at the bottom creating a trapezoidal shape that is gently rounded where it meets the wreck's bottom. The wreck's bottom is flat with a defined, but not hard, chine. She has three bench seats, the one nearest the stern is exceptionally wide, and the port side oarlocks are extant while the starboard side examples are missing. At least one aluminum rivet is visible going through the hull on the port stern quarter. On both stern quarters the remains of a brand name are visible, but illegible; what appears to be an 'S', 'a', and what might be a 'u' are located on the port side, and a 'u' may be attached to the starboard side. These letters are not painted or transferred onto the hull but are applied, and appear to be metal or plastic.



A sonar image of Anomaly 264.



The stern and rear seat of Anomaly 264 (by Kelly Nehowig).



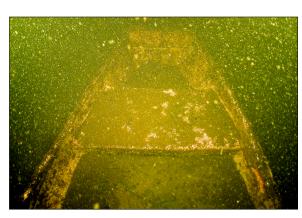
Amidships and the bow of Anomaly 264 (by Kelly Nehowig).



The bow of the Anomaly 264 is damaged (by Kelly Nehowig).



The port side stern quarter of Anomaly 264 may have a partial brand name affixed to the hull but it is unreadable (by Kelly Nehowig).



The transom of the Small Aluminum Wreck is exceptionally narrow in comparison to her amidsips beam (by Mark Slick).



Anomaly 264's narrow stern (by Mark Slick).



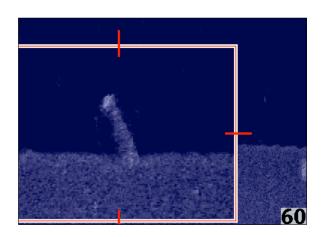
Anomaly 264's bow showing the extruded aluminum caprail (by Mark Slick).

Because Anomaly 264 does not have a registration number, MHM is positive she sank prior to 1972, the year when smaller non-motorized boats, canoes, and sailboats were required to register with the State (*Mound-West Tonka Minnetonka Sun* 1972). While Anomaly 264 could carry a small outboard motor, she may have been primarily used as a rowboat. It is probable that Anomaly 264 sank significantly earlier than 1972 since there is an average of 2 inches of sediment build-up in her hull in an area of the lake where silt collects slowly. For comparison, the Blue Star Miamian Custom Runabout Wreck that lies 785 yards to the southwest of Anomaly 264, contains less than .25 inches of sediment in her hull and she sank in 1965 (see below). Silt must build up in Anomaly 264's hull at a slightly faster rate than the Blue Star Wreck because the lake bottom is softer and has more silt lying on top of the hard pack sand. Therefore, assuming a 1965 sinking date, Anomaly 264 has only accumulated .041 inches of silt per year inside her hull. At this time MHM cannot determine the wreck's brand, year of manufacture, or sinking date beyond the pre-1972 determination. With continued research, MHM hopes to answer these questions and nominate the Small Aluminum

Wreck as a nautical archaeological site. In the meantime, Anomaly 264 is classified as an historical cultural resource and is protected under the jurisdiction of the DNR.

Alumacraft Model A Wreck (Anomaly 462)

During the LMS-1 Project in November 2011 MHM recorded the sonar image of Anomaly 462. Initially the anomaly was not noted during the sonar review because MHM's research boat traveled directly over the top of it and 'cut it in half'. The down image of the anomaly indicated clearly that an object was standing off the lake bottom in the water column. MHM dove on the anomaly in early July 2014 and confirmed that she is an aluminum fishing boat with an outboard motor. The hull is standing on her stern in the water column, the motor's powerhead is buried in the lake bottom, and the lower unit and propeller are protruding out of the sediment. Her registration number is MN 0512 AK, indicating she first registered in 1959, and she carries a blue Minnesota-shaped validation sticker from the years 1983-1984-1985. Information supplied by the DNR confirmed her date of manufacture as 1949, her last date of registration was 1985, and she is an Alumacraft (John Nordby, personal communication, 10 July 2014). MHM has determined Anomaly 462 is a Model A based on the dimensions of her hull when compared to Alumacraft's Model F, a slightly larger and heavier boat of the same length and design. The Model A is 14 feet long with a 29 inch beam amidships, has four seats, a bow casting designed for strength that incorporates a carrying handle, a hull-length splash rail, and 2 oarlocks on each gunwale. Anomaly 462 is classified as an historical cultural resource and is protected under the jurisdiction of the DNR.



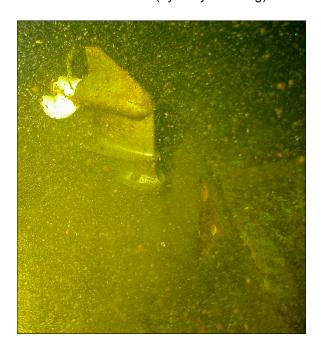
A sonar down-image of the Alumacraft Model A Wreck. The wreck's stern and outboard motor are imbedded in the lake bottom while the rest of the hull is suspended in the water column.



The wreck suspended in the water column (by Kelly Nehowig).



The wreck's bow (by Kelly Nehowig).



Above: The Alumacraft Model A Wreck's outboard motor's lower unit and propeller are protruding from the lake bottom. The lower unit's color suggests it may be an Evinrude motor (by Mark Slick).

Right: The Model A was the featured in many older Alumacraft catalogs (Aluma Craft Boat Company 1946).



The bottom of the hull (by Kelly Nehowig).



The wreck's registration number MN 0512 AK, given to the boat in 1959 (by Mark Slick).

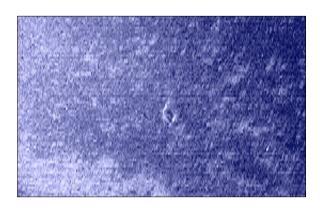


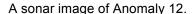
An Alumacraft Model A (Aluma Craft Boat Company 1958, 11).



Aluminum Canoe Wreck (Anomaly 12)

During the LMS-1 Project in November 2011 MHM recorded the sonar image of Anomaly 12. MHM dove on the anomaly in early July 2014 and confirmed that she is an aluminum canoe wreck. The hull is 16 feet long and 2.9 feet in the beam amidships, has two seats fore and aft designed with carrying handles, three gunwale-level thwarts, and two pointed ends. The canoe's sheerline is nearly straight, an attribute more commonly found in the design of fiberglass canoes. The 16-foot length is also anomalous since the majority of aluminum canoes discovered during research measured either 15 or 17 feet, and the 16-foot long examples most often had square sterns. MHM has not been able to determine the canoe's brand or year of manufacture. The wreck has a round green registration sticker along with a Minnesota-shaped validation sticker dated 1984 adhered to it on the bow's starboard side, suggesting she sank in the mid-1980s. The round sticker is unreadable due to zebra mussel coverage but with some cleaning, the registration number may be legible and it is unknown if the port side sticker exists. MHM contends Anomaly 12 was scuttled as evidenced by the removal of her bow and stern decks and the flotation foam that would have been contained by a bulkhead attached to the small deck pieces. Amidships and toward the stern on the port side the canoe experienced thwart and hull damage, being somewhat crushed. MHM contends this damage occurred prior to the canoe's sinking and might have been the major reason for her scuttling. The removal of the flotation foam would assist in the canoe's sinking if the vessel was swamped or capsized intentionally by her owner. Further research is required to determine the canoe's brand, date of manufacture, and Minnesota registration number. Anomaly 12 is classified as an historical cultural resource and is protected under the jurisdiction of the DNR.

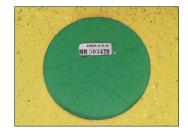






The starboard bow of Anomaly 12 with registration and year validation stickers (by Mark Slick).

This round green Minnesota sailboat registration sticker is similar to the one adhered to the bow of Anomaly 12 (by MHM).

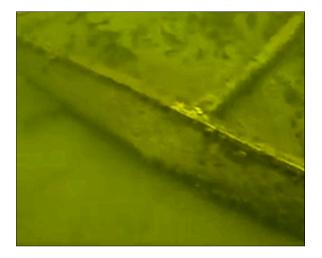




The bow and amidships (by Kelly Nehowig).



The stern of Anomaly 12 with the missing afterdeck and flotation foam (by Kelly Nehowig).



Damage to the canoe's port side and the missing flotation foam suggest she was damaged and then sunk intentionally (by Kelly Nehowig).

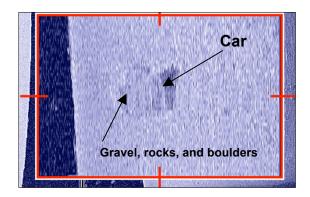


The bow and stern seats have carrying handles and there are amidships thwarts to assist with carrying the canoe (by Mark Slick).

1936 Plymouth 4 Door Sedan (Anomaly 460)

During the LMS-1 Project in November 2011, MHM recorded a sonar image of Anomaly 460. In late July 2014, the anomaly was identified as an upside down car. MHM has determined, from the presence of several diagnostic attributes, that the car is a 1936 Plymouth 4 Door Sedan. The body of the car is almost completely crushed, with the exception of the passenger side quarter window in the C pillar, rear 'suicide' (rear hinge) door, and front door, both complete with windows. The underside of the car is intact and the frame, axles, leaf springs, running boards, oil pan, exhaust system with muffler, battery box, gas tank, and rear wheel drive axle are clearly visible. The front and rear bumpers, as well as the right rear fender, are still attached to the car's frame. A small right side round red taillight survives and is attached to a spacer that has fallen away from the right rear fender. The right front fender is detached and lying on the lake bottom near its original position with a headlight attached to a spacer that is located

between the fender and the hood of the car. The radiator is in place and the vehicle's tall and narrow grille is in front of it. The grille's center section has fallen away and rests on the lake bottom and the entire grille has loosened from its original place behind the front bumper. The Plymouth has 4 intact white wall tires.



The sonar signature of Anomay 460, the 1936 Plymouth Sedan, suggested a small boat wreck near some rocks and gravel. While not a boat wreck, the car landed on a large pile of rocks, boulders and gravel where a fisherman might find a good fishing spot.



The 1936 Plymouth Sedan's passenger side (by Kelly Nehowig).



The underside of Anomaly 460 (by Kelly Nehowig).



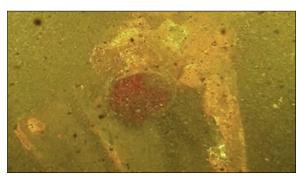
Anomaly 460's right rear door window (by Mark Slick).



The passenger side 'suicide door' (by Kelly Nehowig).



The car's grille and radiator (by Mark Slick).



A rear tailight (by Mark Slick).



Two 1936 Plymouth Sedans from fhe tront and the rear (Oldtimer Picture Gallery 2001).



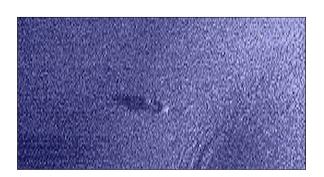
MHM initially identified Anomaly 460 as a 1936 Studabaker, but differences in the grille, headlights, and taillights precluded that identification when compared to the 1936 Plymouth. It is apparent that car manufacturers changed their front doors from the rear hinge to the front hinge design while leaving the rear doors with rear hinges after the 1935 manufacturing year. A survey of 1937 and later Plymouth sedan examples indicate there were slight design changes every year that do not match Anomaly 460. Therefore, MHM is confidant Anomaly 460 is a 1936 Plymouth 4 Door Sedan and contends the car was driven onto the ice by a fisherman. The lake bottom is hard and rocky in this area, and Anomaly 460 came to rest on a pile of rocks and boulders, probably a good fishing spot. However, at this time it is not possible to determine a sinking date and this anomaly is classified as submerged historical cultural resource and is protected under the jurisdiction of the DNR.

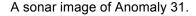
Update: Blue Star Miamian Custom Runabout Wreck (Anomaly 31) (Former Outboard Speedboat Wreck)

MHM first investigated the former Outboard Speedboat Wreck in October 2013⁷. She is 15.8 feet long with a 76.8 inch beam, carries a 1960 40 HP Johnson Super Sea Horse

⁷See MHM's *Lake Minnetonka Nautical Archaeology 2 Project Report* for a detailed description of the wreck.

outboard motor, and is constructed of fiberglass. The wreck has a partial registration number on both her port and starboard sides, MN 59 5 BB, along with a yellow legible 1964-1965 year validation sticker on her starboard side. This letter sequence falls within the BA-BH range that were issued in 1962 (Deephaven Argus 1964). In late May and early June 2014, MHM returned to the wreck to collect further data to answer questions about the wreck's nature, including whether she was made of aluminum or fiberglass⁸. The missing third number in the registration sequence on both sides of the vessel – and it appears the boat's owner never applied the missing digit on either side – suggests the store where the numbers were purchased ran out of the desired one. Information supplied to MHM by the DNR in 2013 suggested that the wreck's missing number was a 0, 3, 4, 6, or a 9 (John Nordby, personal communication, 8 October 2013). In June 2014, MHM located the wreck's builder's and Outboard Boating Club of America's (OBC) plates attached to the transom. During cleaning, the plates detached from the hull and MHM nautical archaeologist Christopher Olson retrieved them for informational purposes as artifact samples. MHM cleaned the plates with gentle electrolysis, using hot water, calcium carbonate, a galvanic (sacrificial) zinc alloy anode, and a soft brush. The wreck is a Blue Star boat constructed in Miami, OK, with the serial number 11461. MHM contends she is Blue Star hull #114 built in 1961. This serial number is different than the Hull Identification Number (HIN) that was required to be stamped into the transom of all boats built or imported into the US after November 1, 1972 (National Association of State Boating Law Administrators ND). The OBC plate declares the boat's maximum speed for her outboard motor is 60 HP and the maximum weight she can carry, including people and gear, is 1480 pounds. The information contained on these two metal plates was crucial to MHM for the identification of this wreck. MHM contends the wreck is a white 1961 Blue Star Miamian Custom Runabout based on the size, capacity. and construction material of the wreck. The 1961 Miamian Custom Runabout is the only Blue Star boat that could carry a 60 HP motor and 1480 pounds of people and gear and is the correct size. The official size of the 1961 Miamian is 15.25 feet long with an 80inch beam, very close to MHM's field measurements (Outdoors, Inc. 1963).

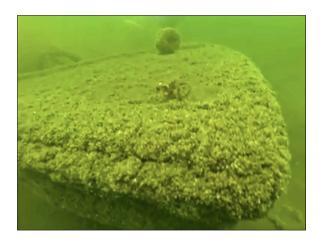






The starboard side of the Blue Star Miamian Custom Runabout Wreck (by Kelly Nehowig).

⁸The proliferation of zebra mussels on the wreck initially prohibited the determination of the wreck's hull material.





Anomaly 31's bow (by Kelly Nehowig).

Anomaly 31's stern and motor (by Kelly Nehowig).



The builder's plate was removed and then returned to the Blue Star Miamian Custom Runabout Wreck (Anomaly 31). If MHM had not located and cleaned this plate, the identity of the wreck would still be unknown (by MHM).



This Outboard Boating Club of America capacity and ratings plate assisted MHM in determining that Anomaly 31 is a Miamian Custom Runabout due to the maximum weight and horsepower engine she could carry (by MHM).

MHM has concluded that the Blue Star Miamian Custom Runabout Wreck was built in 1961 and based on the presence of the 1964-1965 validation sticker and the up position of her outboard, she was resting at a dock, broke free, and sank during the May 6, 1965 Deephaven Tornado. During the wrecking process her seats were dislodged from the vessel and are not currently with the wreck. The hull of Anomaly 31 contains less than .25 of an inch of silt, an accumulation rate of only .005 of an inch per year. She lies on hard packed sand, indicating water moves through this section of Lake Minnetonka quickly, and sediment does not fall out of the water column readily. In late June 2014, MHM returned the Blue Star builder's plate and the OBC plate – the archaeological samples - to the wreck, enclosed in a waterproof plastic pouch with a notation establishing MHM's presence on the wreck and the date the artifacts were returned to the site. Blue Star boats are rare and locating photographs or newspaper ads featuring them are few and primarily date to the 1950s. The 1960s examples found are open fishing boats, not runabouts, and are constructed of aluminum. However, one photo of an unidentified boat may be a Blue Star Miamian or it is very similar to the wreck. The only discernible differences in the two boats are the squared-off slope of the transom shown in the boat in the photo as opposed to the curved transom slope of the wreck, and they have different dashboard plates. The vessel in the photo may be a Miamian manufactured in a different year, possibly 1960 or 1962-1964 with a slightly different design. The earliest date MHM can submit the Blue Star Miamian Custom Runabout Wreck for consideration as an archaeological site is May 10, 2015 based on the evidence presented here. Currently the wreck is classified as an historical cultural resource and is protected under the jurisdiction of the DNR.



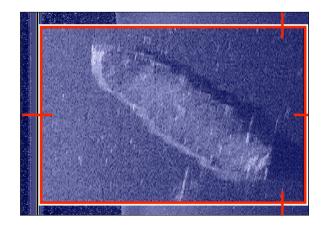
The white rectangle is a dated label from MHM noting the removal and return of the wreck's builder's plate and OBC plate. The label and plates are enclosed in a waterproof plastic pouch that MHM attached to the wreck's plywood deck (by Mark Slick).



MHM is unsure if the boat pictured above is a Blue Star Miamian, but this image is the closest match to Anomaly 31 yet located.

Update: Wayzata Bay Wreck, 21-HE-401

MHM identified the Wayzata Bay Wreck as a wooden model barge in May 2013 and through research, determined she sank on September 31, 1879 and is the oldest known wreck still on the bottom of Lake Minnetonka. 9 MHM planned a dive on the wreck during this project to include the site in the 2014 sediment build-up study. The model barge has large hatches in her deck that facilitated the build-up of sediment inside the wreck's hull. In mid-June 2014, MHM determined the sediment build-up in the hull of the wreck measured 16 inches, an accumulation rate of .12 inches per year. This small number indicates that water moving through Wayzata Bay on its way to the Grays Bay outlet is moving quickly and very little silt settles out in the process. MHM submitted a site form update to the OSA in August 2014 describing this data collection process.





Left: The amidships deck and hull of the wreck (by Kelly Nehowig).

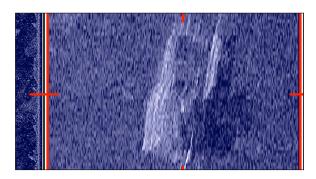


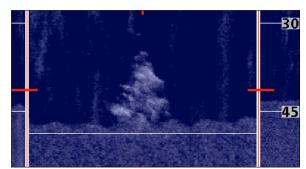
Update: Owens Cruiser Deluxe Wreck (Anomaly 55)

MHM identified the Owens Cruiser Deluxe Wreck, a 1959 model, from information gathered during a dive in November 2013¹⁰. The site is 16.4 feet long by 8.2 feet wide; in 1959 the Owens Cruiser Deluxe was 22 feet long and 7.8 feet in the beam. The wreck is missing her bow and was involved in a collision on July 31, 1970 that resulted in the deaths of three people (Maverick 1970; Mound-Westonka Minnetonka Sun 1970). MHM returned to Anomaly 55 in early July 2014 to confirm the amount of sediment accumulated in her hull. In 2013, MHM determined there was only a trace of sediment in the hull but this fact required confirmation for this project's sediment build-up study. On returning to the wreck, it was determined that the 2013 silt measurement was made in a raised area of the hull (a metal component that was attached to the inside of the hull)

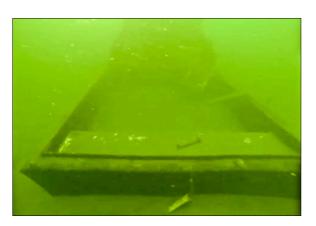
⁹See MHM's Lake Minnetonka Nautical Archaeology 1 Project Report for a detailed description of the wreck. Note: The oldest watercraft wreck (AD 1025-1165) located on the lake bottom is the Lake Minnetonka North Arm Dugout Canoe (21-HE-438), documented by MHM in the *Minnesota Dugout Canoe Project Report*.
¹⁰See MHM's *Lake Minnetonka Nautical Archaeology 2 Project Report* for a detailed description of the wreck.

and was not an accurate measurement of the sediment build-up in the wreck. The new measurement of an average of 8 inches of silt in the hull is accurate and can be used for comparison with other wreck sites (see Anomaly 172 above). Since the wrecking date of the Owens Cruiser Deluxe Wreck is known, sediment has accumulated in her hull at a rate of .18 inches per year. The wreck is classified as an historical cultural resource and is protected under the jurisdiction of the DNR until August 1, 2020 when she can be designated as a nautical archaeological site through the OSA.





Two sonar images of Anomaly 55. The left image is a side-scan and the right image is a down-image.



The port side of Anomaly 55 (by Mark Slick).

Anomaly 55 from the stern (by Kelly Nehowig).



The starboard side Owens logo and porthole (by Mark Slick).



The bow is missing foreword of the cabin windshield (by Kelly Nehowig).



A smooth-hulled 1959 Owens Cruiser Deluxe (Holiday 1959, 112-113).

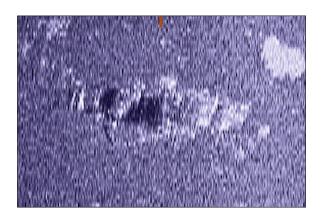
Update: Terra-Marina Amphibious Houseboat Wreck (Anomaly 4)

MHM investigated the Terra-Marina Amphibious Houseboat Wreck in June 2013¹¹ and returned to the wreck in early June 2014 in an effort to locate the boat's registration number. The wreck is 30 feet long, although the site is larger due to a number of artifacts that were thrown clear of the vessel during the wrecking process, and carries a 1959 Evinrude Golden Jubilee Lark Deluxe 35 HP outboard motor. It was hypothesized that the port side bow would be the best location to see the number since starboard side wreckage prevented exposure of the hull on that side. However, the number was not adhered to the hull, but was located by volunteer Josh Knutson on the remains of the wreck's superstructure. The number had eluded the 2013 investigation because the it is facing the lake bottom on a fallen piece of the boat's cabin that rested at an angle, not flat on the bottom. Josh located the number by inserting his powerful dive light between the wall of the cabin and the lake bottom, revealing an 'MN 7494'. The two letters that completed the registration information were obscured, so MHM's Olson and Josh removed enough sediment to reveal them. They had to surface twice between cleaning activities to allow the silt to settle before the letters were revealed to be 'AC'. This letter combination indicates the boat was first registered in 1959 since the last number and letter sequence to be assigned that year would have been MN 7782 AQ. MHM also deciphered a red 1974-1975-1976 year registration validation sticker on the cabin. DNR records indicate that the registration number MN 7494 AC was assigned to a 1957 28foot "Bruns", short for "Brunswick", and that the vessel was last registered in 1976. An anonymous source that provided contradictory pieces of information to MHM in 2013 claimed the boat sank in a collision with a speedboat on July 3, 1976, although no contemporary reports of this accident have been located. MHM has established that information supplied to the State by boat owners pertaining to boat registration information has often been wrong. The Brunswick Corporation did not construct boats until 1960 when that corporation acquired Owens Yachts and Minnesota's Larson Boat Works, only to sell Larson four years later. MHM stands by our identification of the

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¹¹See MHM's Lake Minnetonka Nautical Archaeology 1 Project Report for a detailed description of the wreck.

wreck as a Terra-Marina brand due to the unique design of the steel hull at the bow and stern, the rear cabin design that is characteristic of this brand, and the fact she cannot be a Brunswick vessel (Brunswick Corporation 2014; John Nordby, personal communication, 3 October 2013; 11 December 2013; 9 June 2014). MHM contends Anomaly 4 likely sank in a 1976 accident based on her condition and validation sticker, and the search for contemporary accounts of the incident will continue. The Terra-Marina Amphibious Houseboat Wreck is a significant and rare maritime historical resource and is under the jurisdiction and protection of the DNR.



A sonar image of Anomaly 4.



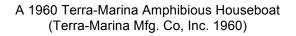
The bow of Anomaly 4 showing the front of the cabin is completely destroyed (by Ed Nelson).



The starboard side superstructure of Anomay 4, looking toward the bow (by Kelly Nehowig).



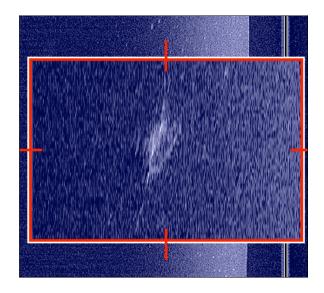
The port side of the wreck looking twoard the stern (by Kelly Nehowig).





Update: Alumacraft Model R Runabout Wreck (Anomaly 20.1)

MHM investigated the Alumacraft Model R Runabout Wreck in June and July 2013 and returned to the wreck in mid-June 2014. She is a 1949 model with a registration number of MN 4757 AQ, indicating she first registered in 1959. She is just under 12 feet long and was last registered in 1979. The purpose of this current inquiry was to measure the sediment build-up in her hull and attempt to read her hull number. MHM was unable to discern the hull number that is imprinted on the centerline stern knee casting because of sediment build-up and the bad visibility that resulted in the attempt to shift the silt. It was determined that the hull contained an average of 7 inches of sediment, indicating that silt settled out of the water column at a rate of .20 inches per year, assuming a 1979 sinking date. Anomaly 20.1 is classified as an historical cultural resource and is protected under the jurisdiction of the DNR until late 2029 when she can be designated as a nautical archaeological site through the OSA.





A sonar image of Anomaly 20.1.

The Alumacraft Model R Wreck (by Ed Nelson)

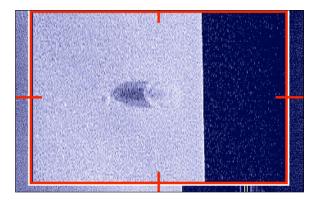
Update: Red Fiberglass Wreck (Anomaly 32, Formerly Span Wreck)

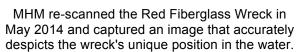
During the LMS-1 Project, MHM recorded the sonar image of Anomaly 32 in November 2011 and dove on the object in mid-October 2013. MHM confirmed she is a capsized fiberglass inboard/outboard wreck and her stern is imbedded in the lake bottom while her amidships section and bow are suspended in the water column. Anomaly 32's registration number is MN 3752 EG, recorded after the removal of zebra mussels, and in Minnesota's official records she is listed as a 1970 Span America 18 foot long boat registered through December 1991¹³ (John Nordby, personal communication, 16 October 2013). The 1970 Span America identification could not be correct since the Span America Company was known as Span in its later years and the corporation was out of business before 1970. In addition, certain attributes documented in 2013 did not

¹²See MHM's *Lake Minnetonka Nautical Archaeology 1 and 2 Project Reports* for a detailed description of the wreck.

¹³See MHM's Lake Minnetonka Nautical Archaeology 2 Project Report for a detailed description of the wreck.

match up with any Span boats that were well documented in catalogs. In mid-June and late July 2014, MHM returned to the wreck to search for identifying emblems and to investigate the inside of the hull more thoroughly.







MHM first investigated Anomaly 32 in mid-October 2013. The wreck was profusely covered in zebra mussels (by Kelly Nehowig).

In June it was discovered that Anomaly 32 has a Chrysler Marine Volvo Penta engine, identified by her metal dashboard plate. Further, it was determined that the inner and outer hull are both red, there are seats on either side of the stern doghouse where the engine is housed, and the hull held two unidentified blue objects. In July MHM searched again for Span or Span America emblems on the port and starboard guarter stern and found no brand identifiers. However, one blue object was a life jacket and the other blue object was identified as a gym bag. MHM retrieved it to determine if it contained information that could identify the wreck. It was MHM's intention to ascertain what was in the bag, document it, and return it to the wreck. Once on the surface, MHM opened the bag and among clothes, shoes, a watch and other items, a brown leather wallet was discovered that contained a Minnesota driver's license. Because the wreck cannot be designated as an archaeological site for about 25 years and the bag had an identifiable owner, MHM retained it and searched for its owner, locating him in another state. MHM contacted the Hennepin County Sheriff's Water Patrol (MHM also informed Lake Minnetonka's Conservation Officer of our actions) and made arrangements with the Sheriff to return the bag to its owner.

The bag's owner took possession of it six days after MHM retrieved it from the wreck and MHM spoke with him about the wrecking process. The bag's owner was not the owner of the boat, but was moving her for the owner in 3-foot waves with the assistance of another friend. During the trip in choppy waters, the outdrive's boot (rubber transom seal) failed and water rushed into the boat at such a rate that the boat began sinking quickly. The man grabbed his gym bag in order to save his belongings, but it was pulled from his grip as the boat sank, nearly pulling him along with her. The gym bag's owner thought the boat was a 1970 Chrysler brand, matching her engine, but through research MHM has concluded there were no Chrysler models matching the Red Fiberglass Wreck constructed during the 1960s-1970s. The wreck is classified as an historical

cultural resource and is protected under the jurisdiction of the DNR until late 2039 when she can be designated as a nautical archaeological site through the OSA.



The wreck's dash is red, the steering wheel intact, and the controller box is in place. The blue object under the dash is a life jacket. This image has been rotated 180° (by Mark Slick).



The metal dashboard plate is labeled with a Chrysler Marine logo in the top left corner and it also identifies the engine as a Volvo Penta brand. This image has been rotated 180° (by Mark Slick).



The blue gym bag MHM recovered was lying on the lake bottom next to the overturned doghouse, the square cover for the engine. MHM contends the bag had contained some air that would have compressed during the wrecking process. It was trapped under the wreck, possibly floating. The air then left the bag entirely and it came to rest on the bottom (by Mark Slick).



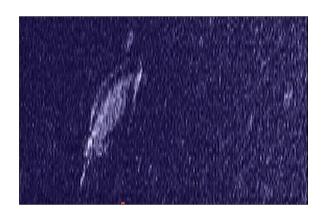
Compare this image of the bottom hull of the Red Fiberglass Wreck taken in June 2014 to the one above from October 2013. Most of the zebra mussels on the bottom are gone except for those in the deeper water. This suggests the high water conditions of Lake Minnetonka affected the zebra mussel infestation of the wreck since she lies at the border of their survival at normal water levels. Live mussels are attached to the wreck toward the stern in deeper water (by Mark Slick).

Update: Gideon Bay Wreck, 21-HE-415

MHM identified the Gideon Bay Wreck as a wooden rowboat with damaged port and starboard gunwales in May 2013.¹⁴ MHM volunteers Kelly and Ann Nehowig re-visited the Gideon Bay Wreck in early August 2014 during this project to include the site in the

¹⁴See MHM's Lake Minnetonka Nautical Archaeology 1 Project Report for a detailed description of the wreck.

2014 sediment build-up study. Interestingly, since May 2013, the amount of sediment in the hull of the wreck has shifted and lessoned, unlike the other targeted wrecks in the study. This observed movement of silt in a 13-month time period indicates that water moves through Gideon Bay quickly in the area of the wreck even on the lake bottom. The shifting silt exposed the stern inside the hull and MHM has determined the wreck has a wineglass transom, an attribute not previously known. The St. Louis Bay Wreck (21-HE-422), another rowboat, also has a wineglass stern. However, that wreck was of lapstrake construction (hull planks overlap) as opposed to the Gideon Bay Wreck's carvel design (hull planks are fastened edge to edge). MHM submitted a site form update to the OSA in August 2014 describing the newly obtained data pertaining to the wreck.





A sonar image of the Gideon Bay Wreck (21-HE-422).

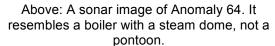
The wineglass stern of the Gideon Bay Wreck (by Kelly Nehowig).

Weeres-Style Pontoons (Anomalies 64 and 133)

MHM recorded sonar images of Anomalies 64 and 133 in September 2011. In mid-June 2014, MHM volunteers Kelly and Ann Nehowig investigated them and determined they are both pontoons. The design of the pontoons suggest they were constructed by the Weeres Company - or at least inspired by Weeres - in the early 1950s. Ambrose Weeres of Richmond, MN, experimented with "steel barrels, welded together end to end" that supported a flat platform boat deck and produced "The Empress" in 1952. Mr. Weeres sold several of these pontoon boats around Richmond and with their success, Weeres Pontoons was founded and is still in business (Weeres Pontoons 2014). Anomaly 64 is comprised of 14 barrels welded end to end and reinforced with 7 metal straps that are visible; there may be more straps that are not discernible. There are 10 square holes cut into the top of the drums to accept wood supports for a flat boat platform. One end is buried in silt and it is apparent the 14th barrel is angling downward, suggesting a tapered end. The pontoon measures 39 feet long, assuming that the 14th barrel is complete. Anomaly 133 is constructed similarly to Anomaly 64, although it is shorter and it cannot be discerned if there are metal straps reinforcing the pontoon. It lies in shallower water than Anomaly 64 and is covered in zebra mussels. This shorter pontoon is comprised of 5 barrels with 3 square holes on top to accept the platform

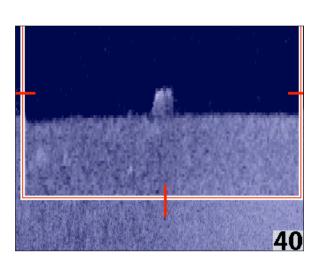
supports and its end tapers. Anomaly 133 is 14 feet long – assuming the 5th tapered drum is full length. The blunt or what would be the stern end of Anomaly 133 an anchor line wound around it and a Danforth anchor is resting on top of the pontoon. Apparently a boater set their anchor near the pontoon and in the process of dragging it, snagged Anomlay 133 and wrapped the anchor line completely around the drum. Both pontoons are 23 inches in diameter. Although both pontoons were constructed in the early 1950s, their sinking date or dates cannot be determined. They are classified as historical cultural resources and are protected under the jurisdiction of the DNR.





Above Right: Squares cut into the connected barrels to receive the wooden platform supports and metal straps that helped hold the barrels together (by Kelly Nehowig).

Below Right: The 'barrel end' of Anomaly 64 (by Kelly Nehowig).



A sonar down-image of Anomaly 133.







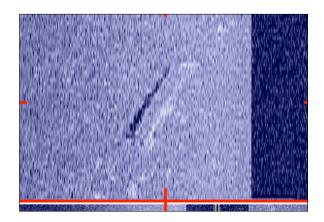
The end of Anomaly 133 with the Danforth anchor and line wound around it (by Kelly Nehowig).



Weeres Pontoons were sold by at least one company on Lake Minneotnka in 1955 (*Minnetonka Herald* 1955).

Carpeted Wooden Dock (Anomaly 368)

MHM recorded a sonar image of Anomaly 368 November 2011 and dove on it in late May 2014, determining it is a carpeted wooden dock. The dock is 20.50 feet long and 4.50 feet wide, the carpet is loose in places, it is partially covered in zebra mussels, and has a metal loop on one end. MHM contends the dock loosened from another dock section or the shoreline during a period of high water or a similar event, probably in the early 2000s. The dock is a cultural resource that is protected under the jurisdiction of the DNR.



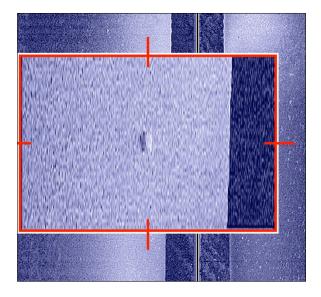
A sonar image of Anomaly 368.



A section of Anomaly 368 (by Kelly Nehowig).

Metal Cylinder (Anomaly 35)

MHM recorded a sonar image of Anomaly 35 in November 2011 and dove on it in late May 2014, determining it is a 5-foot long by 2-foot wide metal cylinder. Holes on one end of the object suggest it may be a water heater. Anomaly 35 is profusely covered in zebra mussels and has probably been on the lake bottom for about 20 years. The cylinder is a cultural resource that is protected under the jurisdiction of the DNR



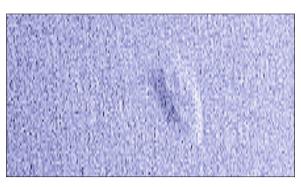


A sonar image of Anomaly 35.

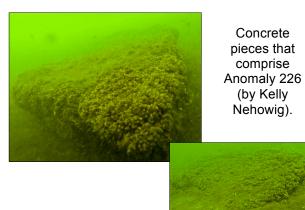
The top of Anomaly 35 (by Kelly Nehowig).

Concrete Pieces (Anomaly 226)

MHM recorded a sonar image of Anomaly 226 in September 2011 and dove on the object in late May 2014. The sonar suggested Anomaly 226 was a small sharp-bowed boat and looked promising. MHM identified it as a triangular piece of concrete with a smaller piece sitting next to it. The larger piece is 3 feet at its widest point and 5 feet long and both are covered in zebra mussels. The concrete was probably dropped from a barge that had removed it from a construction site.

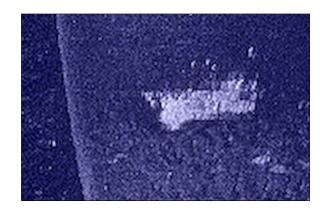


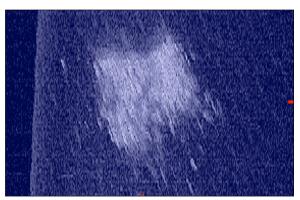
A sonar image of Anomaly 226.



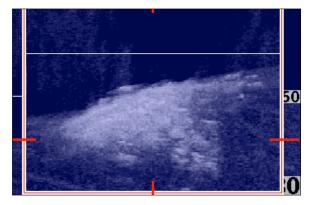
Sunken Bog (Anomaly 15)

In May 2014, MHM re-scanned certain anomalies or targets located in Lower Lake using our side and down-imaging sonar. Included on that list was Anomaly 15. It is a large roughly rectangular object that MHM first suspected was a barge. However, after identifying Anomaly 1 as a sunken bog in 2013 during the LMNA-1 Project, MHM believed Anomaly 15 was likely a bog as well. MHM Chair Mike Kramer confirmed that during low water conditions in 1990-1991, several floating bogs — a collection of vegetation — broke away from the shoreline of the lake and traveled around with the wind (personal communication, June 2013). For example, one 35 by 300-foot bog that was floating in Tonka Bay in mid-July 1991 was considered a hazard to navigation by the town's mayor. She sought State funds to remove that bog and others that had been spotted around the lake (*Weekly News* 1991). The new side and down imaging sonar data confirmed for MHM that Anomaly 15 is a bog and diving on it is not necessary.





Sonar images of Anomaly 15. The image above was recorded in November 2011. The images to the right were recorded in May 2014. They appear differently to the above image due to the speed of the boat and the length of the sonar beam. These new recordings confirm that the anomaly is a sunken bog and not a submerged cultural resource.



Anomalies 30.1, 37, 65, 105, 115, 445

Sonar images of Anomalies 30.1, 37, 65, 105, 115, and 445 were recorded during the LMS-1 and LMS-2 Projects in 2011 and 2012. Their sonar signatures suggested they might be watercraft or other objects because they had substantial acoustical shadows. After diving on these anomalies during the LMNA-3 Project, it has been determined that they are rocks.

Anomalies 36, 41.1, 116, 128, 129, 131, 374, 458, 461

Sonar images of Anomalies 36, 41.1, 116, 128, 129, 131, 374, 458, and 461 were recorded during the LMS-1 and LMS-2 Projects in 2011 and 2012. MHM took advantage of the "No Wake" status of Lake Minnetonka during June and July 2014 to dive on additional anomalies during this project. The lake had little boat traffic during the week and on the weekends, extending the opportunities for MHM to safely dive on several more anomalies. Further, MHM's research boat used significantly less fuel investigating the first 25 anomalies than was predicted because of slow speeds, facilitating the extra work. The nine anomalies listed above were identified as false targets, being either contours on the lake bottom or vegetation that cast significant acoustical shadows.

Anomalies 230, 431, 432, 434, 437, 438

MHM recorded sonar images of Anomalies 230, 431, 432, 434, 437, and 438 during the LMS-1 Project. They are a group of shallow targets included in the LMNA-3 Project because their location allowed the MHM divers to maximize the use of air in SCUBA tanks after dives in deeper areas were completed during the lake's "No Wake" period. These six anomalies were identified as vegetation that cast considerable acoustical shadows.

Conclusion

The LMNA-3 Project produced significant and interesting results, particularly locating 7 new wrecks on the bottom of Lake Minnetonka. The identification of the Hopper Barge Wrecks (21-HE-441) site is particularly significant for the maritime history of Lake Minnetonka. These two Captain John R. Johnson-designed and constructed barges are structurally unique with their hinged side discharge flaps. Their use to increase the amount of land in Excelsior during the first years after the Excelsior Amusement Park opened in the mid-1920s indicates their support of the area's economy and infrastructure. MHM continues to search for similar barges with the port and starboard spoil discharge. The Hopper Barge Wrecks increase the number of known sites on the bottom of Lake Minnetonka that are linked to Captain Johnson to 6, along with Minneapolis (21-HE-403), Priscilla (21-HE-401), Saucy Kate (21-HE-420), and the St. Albans Bay Wreck (21-HE-400). One older wreck with an unknown history, the Wooden Trunk Cabin Cruiser Wreck (21-HE-446) represents early large pleasure craft construction and MHM will continue to research her origins. It is hoped that MHM determines she is a locally-built vessel with a long lake history.

The Minneapolis-built Alumacraft Center Console Model R Wreck (21-HE-448) tells a different story than the Hopper Barge Wrecks, yet the vessels are linked geographically. The users of all three wrecks worked at the junction of Excelsior Bay and St. Albans Bay on Lake Minnetonka, but the function, type, and construction materials of the boats were dissimilar. The working life of the wooden Hopper Barge Wrecks can be determined due to their specialist purpose and construction: containing mud from

dredging sites until it can be dumped through the barge's side flaps at a pre-determined location. Likewise, the aluminum Alumacraft Center Console Model R Wreck's was specifically designed and constructed to move two or three people across a body of water quickly and efficiently. For these three wrecks, through research MHM was able to track their histories and in one case, provide a confirmed eyewitness account of the wrecking process and sinking date.

Contrastingly, the Damaged Bow Utility Wreck (21-HE-447), the Blue Star Miamian Custom Runabout Wreck (Anomaly 31), and Terra-Marina Amphibious Houseboat Wreck (Anomaly 4) presented significant archaeological questions to MHM in 2013 that were left unanswered that season. Follow-up research in 2014 allowed MHM to determine that the Damaged Bow Utility Wreck was first registered with the State in 1959 and that she sank before 1962. Questions remain as to her year of exact manufacture and brand, however. This project produced information about Anomaly 31 that conclusively pinpointed the wreck's year of manufacturer, brand, and construction material while supporting evidence found in 2013 clarifies the first date of registration, sinking date and the wrecking process. Further, even though the Blue Star Miamian Custom Runabout Wreck sank 49 years ago, locating images and detailed information on the brand and model have proven difficult. The discovery of the registration number on the fallen superstructure of the Terra-Marina Amphibious Houseboat Wreck should have confirmed many research questions and while it did answer the questions of the wreck's year of manufacture and first and last years of Minnesota registration, it brought into question the boat's manufacturer. Regardless of the official information supplied to the State from the wreck's owner, MHM is confident the wreck is a Terra-Marina brand and not a Brunswick. By comparison, MHM's research of older Lake Minnetonka wrecks such as the Saucy Kate, Minneapolis, Priscilla, George/Excelsior (21-HE-399), Hercules (21-HE-398), and the Streetcar Boats Como (21-HE-397), Hopkins/Minnetonka (21-HE-396), and White Bear (21-HE-281) has produced detailed histories of the wrecks and numerous images of them.

Like the Terra-Marina Amphibious Houseboat Wreck, the Red Fiberglass Wreck (Anomaly 32) sank relatively recently (1989) and her brand is also in question. State records indicate she is a Span brand boat but physical attributes recorded by MHM and the eyewitness account, dispute this conclusion. To contrast, the brand, type, year of manufacture, and the first and last year of registration of the Alumacraft Model A Wreck (Anomaly 462) are known, but the circumstances of her sinking are unknown and require further research. The Aluminum Canoe Wreck's (Anomaly 12) brand is unknown, but she sank in the mid-1980s and her condition suggests she was damaged and then scuttled as indicated by the removal of her fore and aft flotation foam.

The Small Aluminum Wreck (Anomaly 264) remains an enigma. Her construction is simple but unique, and she does retain evidence of being a brand-name boat. MHM suspects she has been on the bottom of Lake Minnetonka long enough to be considered an archaeological site, but further research is required before that determination can be made. Although they are only parts of boats, the two Weeres-Style Pontoons (Anomalies 64 and 133) are significant pieces of Minnesota maritime

history because of their rarity and they represent Ambrose Weeres's innovative idea that persevered through time. The 1919-1925 Ford Model T Doodlebug (21-HE-bm) represents an innovative endeavor undertaken by a Lake Minnetonka resident to recycle an old car into a useful farm and lumbering vehicle. There are a substantial number of doodlebugs that exist throughout the United States – and not one of them has a duplicate. This unique tractor is an interesting piece of lake and local history that would have remained unknown if not for this project. Lastly, the upside down 1936 Plymouth Sedan represents the long tradition of traveling on a frozen lake as a short cut from 'Point A to Point B' with the thin ice not taken into account. Or, an ice fisherman with bad judgment used his car to get to his fish house too late in the winter. MHM has located three cars on the bottom of Lake Minnetonka to date and we are confidant there are more to identify.

The 2014 Sediment Build-Up Study was a success. Preliminary sediment data collected in 2013 on the Capsized Wooden Boat Wreck (21-HE-418), Century Deluxe Utility Wreck (21-HE-423) and the Correct Craft Aqua Skier Deluxe Wreck (21-HE-424) was built upon by adding data collected on the Wayzata Bay Wreck, Alumacraft Model R Runabout Wreck, Aluminum Canoe Wreck, Hopper Barge Wrecks, Small Aluminum Wreck, Wooden Trunk Cruiser Wreck, Blue Star Miamian Custom Runabout Wreck, Damaged Bow Utility Wreck, Owens Deluxe Cruiser Wreck, and the Alumacraft Center Console Model R Wreck. Additionally, a return to the Gideon Bay Wreck produced data that MHM will use to determine which small wrecks to include or exclude in the on-going Sediment Build-Up Study during future projects. MHM has concluded that sediment in small wooden wrecks with damaged gunwales will be documented but the use of the data must be qualified and its possible changeability noted.

The diversity of nautical, maritime, and underwater sites so far identified in Lake Minnetonka are tangible examples of the rich maritime history of the area. Through research, diving on wrecks and anomalies to collect pertinent data, and ensuring that the collected information is accessible by the public, MHM will continue to investigate Lake Minnetonka's submerged cultural resources into the future. MHM has re-examined the recorded sonar footage from the LMS-1 and LMS-2 Projects using knowledge gained from the comparison of anomalies that have proven to be wrecks or other submerged cultural resources. Several hundred more anomalies have been identified from this re-study and to date. 9 cultural resources have been identified, including 5 wrecks. The results of the LMNA-3 Project summarized above is connected to all the work that came before and will come after its completion. Future work advocated by MHM is in keeping with the recommendations submitted to the SHPO in 1997 concerning the historical significance of Lake Minnetonka's wrecks - those known and unknown. As stated in the report, it was determined that "each of the individual vessels [Como, George/Excelsior, Hercules, Hopkins/Minnetonka, Minneapolis, White Bear] are potentially eligible for nomination to the National Register of Historic Places (NRHP) under criteria A, C, and D. As a group, these vessels...form a strong and important

¹⁵MHM has found instance of pontoon boat construction up to 15 years before Ambrose Weeres designed and constructed "The Empress", but Weeres Pontoons was the first business to successfully produce and market pontoon boats in the long-term.

submerged cultural resource. The historic shipwrecks in Lake Minnetonka may be the single most well-preserved group of excursion vessels in the United States" (Hall, Birk, and Newell 1997, 62).

The 'excursion' vessel classification is too broad to typify the wrecks considered by the SHPO since the Streetcar Boats were actually part of the public transportation system, not 'pleasure' boats. At the same time, 'excursion' is too narrow a term as well considering the number of diverse wreck types MHM has identified between 2011-2014 that were personal watercraft, commercial vessels, and workboats. Therefore, MHM contends Lake Minnetonka's wrecks have more potential for NRHP consideration than determined by previous scholars. In turn, MHM recognizes the wrecks by their nautical construction attributes, materials used, propulsion, and design, not exclusively by their presumed function. With this consideration, to date MHM has recognized 24 watercraft types among the 36 wrecks located in Lake Minnetonka: 1 Woodlands Culture wooden dugout canoe; 1 un-powered wooden model barge; 1 wooden rounded stern propeller steamer; 1 un-powered wooden steam dredge; 2 un-powered wooden hopper barges; 1 inboard wooden trunk cabin cruiser; 1 capsized wooden boat with slot head wood screws; 3 wooden rowboats; 3 torpedo stern wooden steam propellers; 1 wooden sternwheel steamer; 1 wooden sidewheel steamer; 2 wooden steam (1 converted to internal combustion) propeller tugs; 1 metal and wood motorized ice boat; 3 inboard wooden boats; 1 outboard fiberglass runabout; 2 outboard aluminum runabouts; 1 inboard wooden cruiser; 1 fiberglass outboard speedboat with fins; 1 fiberglass inboard speedboat; 2 aluminum canoes; 3 outboard aluminum fishing boats; 1 outboard amphibious houseboat; 1 un-powered metal barge; and 1 pontoon boat. The different types of maritime sites recognized thus far include: 1 steamboat pier at Big Island; 3 marine launch boilers; 2 Weeres-style pontoons; a 1919-1925 Model T Ford Doodlebug; a 1936 Plymouth Sedan; a 1955 Mercury Monterey Four-Door Sedan; a 1974 White Chevrolet Caprice Classic Two-Door Coupe: 1 pontoon raft; and 1 carpeted wooden dock. It is clear that the types of sites that exist in Lake Minnetonka are diverse, archaeologically and historically significant, and worthy of great attention. To date, the watercraft located on the bottom of Lake Minnetonka represent nearly 1,000 years of Minnesota's maritime history. In the historic period, the known wrecks represented in the lake span 135 years of local maritime culture. The data collected during the LMNA-1, LMNA-2, and LMNA-3 Projects are part of the first phase that will allow the development of a Historic Shipwreck or Maritime District nomination for Lake Minnetonka – a first for the State of Minnesota – and if appropriate, a State Underwater Archaeological Park.

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